AVIATION

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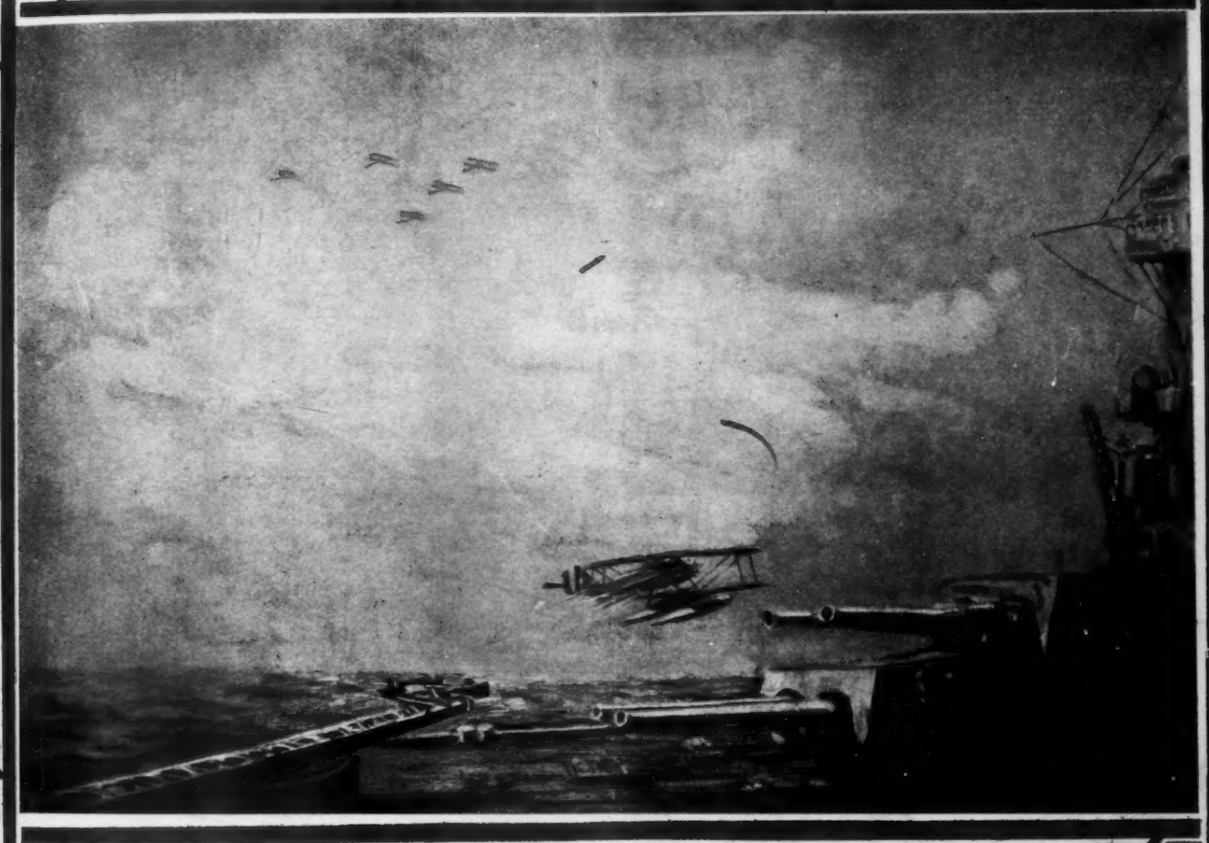

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VOLUME XII
Number 17

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AVIATION

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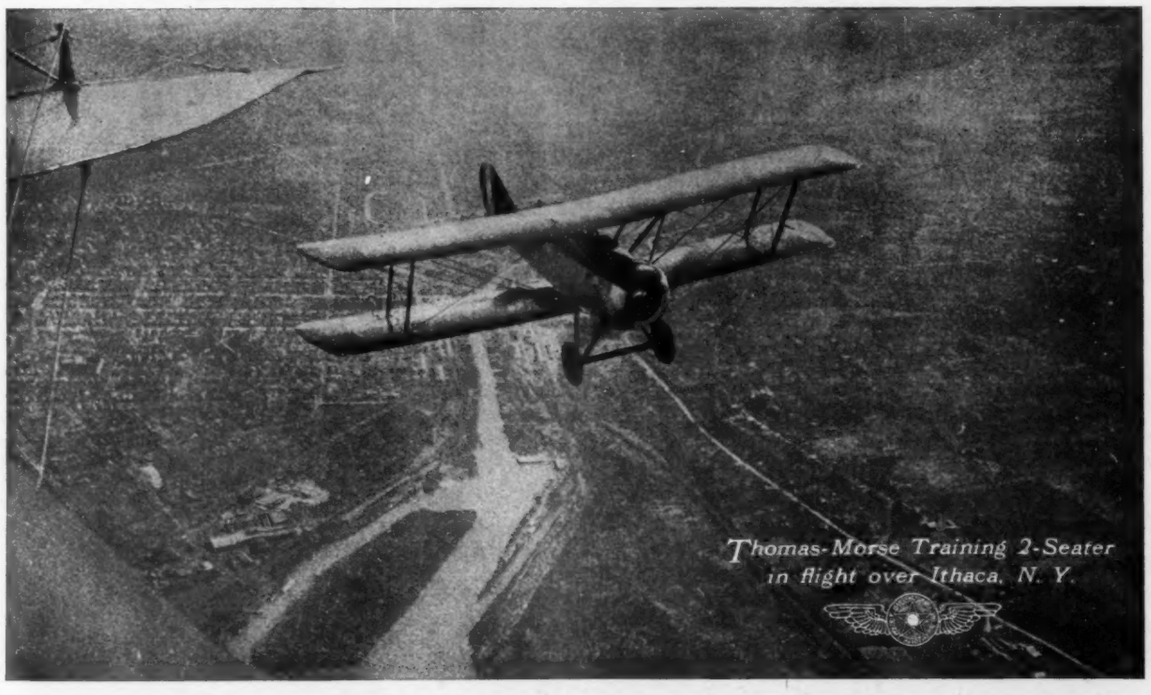

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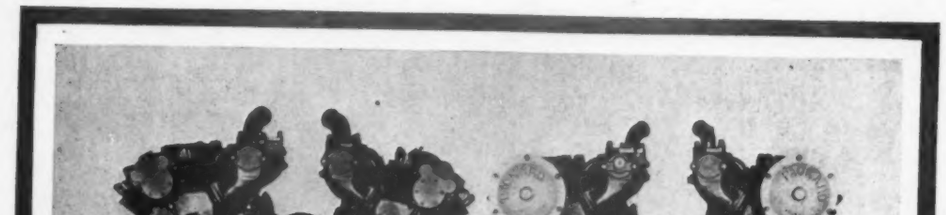

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AVIATION

LADISLAS D'ORCY, EDITOR
VIRGINIUS E. CLARK
EDWARD P. WARNER
RALPH H. UPSON, CONTRIBUTING EDITORS

Vol. XII APRIL 24, 1922 No. 17

Another Safety Demonstration

AEROMARINE AIRWAYS, America's oldest and principal air transport enterprise, in their second semi-annual report of flying operations submitted to the Naval Bureau of Aeronautics can point with justified pride to the fact that not a single passenger or employe was injured during the 735 separate flights made by their flying boats, representing a total of 268,535 passenger-miles. This record, when placed alongside that made during the preceding six-month period, which was equally devoid of casualties of any kind, is the best demonstration of the safety which can be achieved in modern air transport by an airworthy *materiel* and a capable personnel.

New means of transportation in all the history of human progress have had to fight an uphill battle against public prejudice born of ignorance and fear. The railroad, the steamship, the bicycle, the automobile, have all known a period in the history of their development when the public considered it as an extremely hazardous enterprise to ride in them. The airplane has not fully emerged from this period yet; a large section of the public is favorably inclined toward the flying machine, yet the doubting Thomases are still numerous.

It is for this reason that demonstrations of the kind furnished by the "Black Tail Fleet" constitute a very valuable object lesson—both to the public and to the aeronautical world. A record of safe flying, produced repeatedly, cannot but impress the public with the fact that air transport is slowly but surely growing into the fabric of modern civilization; at the same time it is a reminder to those engaged in aviation that safety can be achieved only through the very means which apply on land and at sea: careful operation.

Problems in Seaplane Design

SOME interesting points regarding the design of seaplanes were raised by W. O. Manning in a lecture delivered before the Institute of Aeronautical Engineers of London. The lecturer first pointed out that in the matter of hull design the flexible hull, developed from yachting practice, appeared superior to the rigid hull, for the former absorbed the landing shocks far better. However, the flexible (Linton Hope) hull involved some serious constructional difficulties, for it required flexible bulkheads, and this question had not yet been satisfactorily solved. The importance of having not only watertight bulkheads but also a double bottom was brought out by the lecturer, and also the desirability of providing the wing tip floats with bulkheads, so a puncture of these floats would not put them out of commission.

Then Mr. Manning stressed the importance of designing flying boat hulls which would be really water-tight, and which could be moored out for long periods, instead of having to be hauled up on the slip every night, as is now generally the case. This latter practice the lecturer considered "intolerable" as far more damage was inflicted upon seaplanes while they were handled ashore than when they were afloat.

Regarding the wing structure Mr. Manning was of the opinion that there was wanted a type of strut fitting which would not require the presence of holes in the fabric, as the water enters such holes and rots the wood or corrodes the metal of the wing structure. He also dwelt upon the drawbacks exposed wooden struts presented owing to their being subject to warping under the combined action of humidity and solar heat. Steel was free from this trouble, but had the drawback of being subject to corrosion. With regard to the latter, Mr. Manning called attention to the fact that corrosion did not occur alone from the action of air and salt water, but that it was also due to different metals being in free contact or in non-homogenuous alloys, in which case corrosion occurred much more rapidly than in the case of simple metals. The possibility of using stainless steel was mentioned.

In the discussion which followed the interesting suggestion was made to build docking hangars into which seaplanes would be normally floated for overhauls of the superstructure while for an overhaul of the hull the shed would be pumped dry. This solution, we believe, will become an absolute necessity with the gradual increase in size of the flying boats.

The Sport Airplane

MUCH interest is being shown at present in France in the question of the sport airplane, judging by the numerous articles and letters which appear in the columns of our French contemporaries.

Most aerial sportsmen are agreed that the ideal sport machine would be one involving the lowest possible upkeep and furnishing the highest possible performance for a relatively low horsepower. But when it comes to a practical solution of the problem there is no unanimity. One school of thought suggests the "minimum airplane" represented in France by the Avionette De Pischoff—and in this country by the Mummert biplane—while the other asks for a small and handy two-seater, such as the Sport Farman or the Sperry Messenger, not to speak of larger types. The chief complaint seems to be the lack of a low-powered, economical and sturdy engine, and on this subject opinions are divided between air-cooled and water-cooled types of radial, vertical and V form. But whatever the desires of the owner-pilot, or the prospective one, there appears to be a genuine demand for a cheap sport airplane with a range of about 200 miles.

In this country we actually seem to be further advanced in the design of a satisfactory sport airplane. The "Messenger" biplane, designed by the Engineering Division, Air Service, is for instance an excellent example of high performance with minimum encumbrance, and the Lawrance engine with which it is fitted has given ample proof of both its reliability, simplicity and low fuel consumption.

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The Naval Air Appropriation, 1922-23

Bill Reported by House Committee Only Provides $7,866,500 As Against $17,000,000 Estimate Approved by the President

The Navy appropriation bill for the fiscal year 1922-23 reported out April 8, carries the sum of $233,224,008, which is $193,000,000 less than the amount asked for by the Secretary of the Navy. Naval Aviation, along with other branches of the service, is threatened with a considerable cut owing to this reduction in the appropriation, only $7,866,950 being proposed for the Bureau of Aeronautics, Navy Department, instead of the $17,000,000 estimated by the Secretary of the Navy and the Bureau of Budget, and transmitted to Congress with the approval of the President. The appropriation of $17,000,000 asked for by the Secretary of the Navy was itself a reduction of $21,400,000 on the estimate submitted by the Chief of the Bureau of Aeronautics.

Provision of the Bill

While new construction is not authorized in the bill reported, it is believed that provision may later be made. "For aircraft and accessories in course of construction or manufacture on June 30, 1922," the bill states, $400,000 is provided.

For navigational, photographic, aerological, radio and miscellaneous equipment, including repairs thereto, for use with aircrift built or building on June 30, $165,000 is provided. For the maintenance and repair and operation of the Aircraft Factory, helium plant, air stations, fleet activities, testing laboratories and for overhauling of planes, $5,475,000 is authorized, including $475,000 for equipment of vessels with catapults, and for conducting experiments and development work on all types of aircraft, $1,116,950 is stipulated. For drafting, clerical inspection and messenger service at stations, $710,000 is authorized. This gives a total of $7,866,950 and the money so specified for Aviation shall be disbursed and accounted for in accordance with existing laws the bill directs.

The bill provides that the Secretary of the Navy is authorized to adjust and pay such amounts as may be due on claims for damages which have or may occur to private property growing out of operations of naval aircraft, where the claims do not exceed $250.

It is further provided that no part of the appropriations shall be expended for the maintenance of more than six heavier-than-air stations on the coasts of the continental United States, that no money appropriated shall be used for the construction of a factory for the manufacture of airplanes.

The sum of $54,610 is designated for pay of employes in the Bureau of Aeronautics, provided that no one is paid at a rate of compensation exceeding $1800 per annum, except the Chief Clerk, at $2250, and three clerks at $2000 each. For draftsmen and technical services as are deemed necessary $65,000 is specified.

Only 3.4 Per Cent of Naval Appropriation

The total amount reported by the Committee for Aviation, $7,986,560, is only 3.4 per cent of the total naval appropriation. The Committee, however, estimates that approximately $7,306,575 will be needed for new aircraft and $500,000 for construction work at aircraft stations, and adds, that if Congress should appropriate these additional sums that the total for Aviation for the coming year would amount to $15,793,135. This would be 6.7 per cent of the total Naval Appropriation. The total amount recommended by the Secretary of the Navy and the Bureau of the Budget to the President was $17,000,000 and would be less than the cost of one battleship. As a result of the bombing experiments, the Joint Army and Navy Board reported:

"Aviation and Ordnance experiments conducted with ex-German vessels as targets have proved that it has become imperative as a matter of national defense to provide for the maximum possible development of Aviation for both the Army and the Navy."

This report was approved by both the Secretaries of War and Navy. The total amount—$17,000,000—asked for is inadequate, and unless a larger amount than the Committee proposes is appropriated, Naval Aviation will be seriously crippled during the coming fiscal year.

Detailed Comment

A detailed comment on the provisions of the Bill reported by the Committee follows:

In the report accompanying the House of Representatives Bill No. 11228, on page 11 under the title "Aviation," the Committee states that the sum proposed "exceeds the amount appropriated for the present fiscal year for the same purpose by $953,519." This statement is incorrect and gives an entirely wrong impression as to the money proposed for Aviation. Actually the money reported by the Committee under the subheads is $56,481.00 less than was appropriated for these subheads during the fiscal year 1922. Furthermore the appropriation for maintenance in 1922 was entirely insufficient for that purpose, and in spite of the closing of aviation stations and the cessation of most of the big aviation activities, the expenditures for maintenance during the fiscal year 1922 will exceed the amount appropriated by approximately $450,000. It is thus seen that the amount reported by the Committee is approximately $500,000 less than the actual amount which is being spent in 1922 for this purpose

The Committee, when it states in its report that the sum reported in the bill exceeds the amount appropriated for the present fiscal year for the same purpose by $953,519, neglects the fact that in the bill reported by the Committee, the Bureau of Aeronautics assumes the payment of $535,000 for clerical, inspection, messenger and drafting forces heretofore paid under appropriations of other Bureaus. Corresponding reductions have been made in the appropriations of these other bureaus, and the money deducted has been added to the Aviation appropriation. This, however, does not appropriate more money than was appropriated for the fiscal year 1922, and $535,000 should, for this item alone, be deducted from the $953,519 increase reported by the Committee.

The Provision for Catapults

In addition, the Committee under maintenance has included $475,000 for the construction of catapults. These catapults are essential as they make it possible to launch planes from surface ships. However, as no money was appropriated for this purpose in 1922, $475,000 must be deducted from maintenance in making comparisons with 1922.

Actually, therefore, the Committee has included $535,000 which was appropriated for last year under other bureaus and has included under maintenance an additional obligation for the Bureau of Aeronautics of $475,000 which is not one of the purposes appropriated for under the same subhead last year. There is thus in the total proposed by the Committee an actual reduction of $56,481 from the amount appropriated in 1922.

The feature of the bill as reported by the Committee, which is inadequate, is the appropriation under the subhead for Maintenance and Operation. The sum reported by the Committee is $5,475,000, of which $475,000 is to be spent for the construction of catapults, leaving $5,000,000 for operation and maintenance. Operation and maintenance charges during 1922 are already running at this rate with the Aviation forces practically inoperative. The Committee's figure is a reduction of $1,618,100 from the figure submitted by the Secretary of the Navy and appearing in the Budget, and is wholly inadequate.

Obsolete War Equipment

It presents during 1923 the prospect of having Naval Aviation largely inoperative as that is the condition today, and such operation as is being carried on is being done to a great extent by the use of surplus war stocks. Little of this

stock will be available in 1923 as it is becoming exhausted and obsolete, and unless the amount of money appropriated for maintenance is increased, aviation operations will have to be further curtailed and the production of helium stopped. Furthermore in 1922 the Fleet, due to a deficiency existing in the appropriation for fuel, has been inactive a great part of the time, thus reducing the cost of requirements of operation of aircraft. In 1923 sufficient money should be provided to permit aircraft to accompany the Fleet during all its maneuvers and this can not be done on any lesser sum than the $6,618,100 submitted to Congress by the Secretary of the Navy and appearing in the Budget.

If the present Naval appropriation bill carrying 67,000 enlisted men is passed, the Bureau of Navigation states that only 2849 men could be assigned to aviation duty. As there are required for our Naval Aviation units over 5262 men, this means that our naval aviation forces will necessarily be cut in half. The present allowance of enlisted men in Naval Aviation is 4100, which is not an adequate force to carry on present aviation activities, it is said.

M. I. T. Builds Glider

With the final plans drawn up and most of the needed material already on hand, the Aeronautical Engineering Society of the Massachusetts Institute of Technology is waiting only for the beginning of the third term before starting actual construction work on its experimental glider.

Glider Exceptionally Light

Designed along more or less conventional lines, one of the outstanding features of the glider which the Aero Society is working on will lie in its lightness of construction. According to the plans, this will be obtained by the replacing of practically all metal fittings by plywood web construction and dispensing as far as is possible with all bulky structural members. This will be done, however, without the sacrifice of strength.

Boston harbor as seen from the air

The machine will be of the monoplane type with cantilever wing construction. A departure from general practice will be made in building the wings in three sections so as to reduce the size of each section, thus adding to the ease of construction, the portability and facility in assembling. The customary landing gear and wheels will be replaced by skids, and the tail skid will be made of balsa wood which is exceedingly light.

Use Standard Wing Section

Some of the foreign gliders were built without the usual number of control surfaces, however in this case, for the sake of positive maneuverability, the designers are using the three surface controls, namely: elevator, rudder and ailerons. A standard wing section, the Martin No. 2, which gives a high lift, will be used. This combined with the lightness of construction will give a total structural weight calculated at less than 70 lb., and with a wing spread of 23 ft. and wing area of 110 sq. ft., and a very low loading per unit of area. The overall length will be 12 ft.

Designs for the glider were submitted by five members of the Aero Society and the one considered most suitable by the Aeronautical Engineering Department was drawn up by O. C. Koppen '23, and E. T. Allen '23. The glider was then redesigned, the most desirable features of the various plans being incorporated so far as was possible in the final design. The stress analysis was then worked through in the design of the various structural members and approved by Prof. E. P. Warner, who is acting merely in an advisory capacity to the men engaged in the work.

May Fly at Framingham

Practically all the materials to be used in the construction have already arrived, says *The Tech*, to whom we are indebted for these details. The facilities of the pattern making shop will be employed in the work, which will be done by the members of the Aero Society during whatever spare time they can find. The actual tests will probably be carried out at Framingham or at some other point where a suitable hill is available. Though a number of methods of getting the glider into the air are under consideration, none have as yet been definitely decided. E. T. Allen '23, has been largely responsible for the progress of the plans thus far.

The officers of the society hope to be able to carry out the actual tests before the end of the school year. If the performance of the glider comes up to the expectations of its designers, another one will probably be built next year in which various necessary refinements will be made, as experience with the first machine will dictate.

A Letter

Editor, AVIATION:

In the issue of Feb. 6, 1922, of your publication you printed under "Foreign News" a note by U. S. Vice Consul Edmund B. Montgomery at Baranquilla, Colombia, concerning our company, which note in several parts does not correspond to reality.

First, we do not get any subsidy from the Colombian government; on the contrary, we have to pay the government $0.03 for every 15 grams of mail carried by our planes.

Second, our seaplanes, of which we have six at the moment, are not fitted with 500 hp. engines, but only with a 185 hp. B.M.W., the machines and engines being of the same type as the one with which a new world's duration record was recently established in the United States.

Third, the flight from Baranquilla to Girardot, the terminal station of the Bogota Railway, takes 7 hr. From Giradot the mail is carried by train to Bogota in 10 hr.

Fourth, the seaplane flying weekly to Cartagena leaves Baranquilla on Monday at 8 a. m., and returns at 4 p. m. of the same day. The passenger fare on this route is $35.00 (Colombian). The aerial postage to the interior is 30 cents for every 15 grams.

Our agent in New York is not Vasques Correa & Co., but Don Gonzalo Mejia, 44 Whitehall St.

SOCIEDAD COLOMBO-ALEMANA DE TRANSPORTES AEREOS
Bogota, Colombia

Military Conservatism

Address to the Graduating Class of 1921 by Rear Admiral Wm. S. Sims, U.S.N., President, U.S. Naval War College

The following extracts from the address of Admiral Sims to a class of graduates at the Naval War College have a direct application to the present development of aviation in the Navy. For years the Bureau of Aeronautics idea was opposed by the Navy Department, and now that the idea has become a functioning organism under the able direction of Rear Admiral Moffett, its progress is hampered by lack of appreciation of this new "first line of defense".—EDITOR

Ever since men first began to use weapons to fight each other, military men have been reproached for excessive conservatism, a polite term often intended to imply a dangerous class reluctance to accept new ideas.

All men are naturally more or less conservative; certainly all civil professions are decidedly so; but they can afford to be without much danger to the country, whereas, in the case of the military profession, national disaster might easily result from a lack of the vision necessary to recognize the superiority of a new weapon or a new method of warfare.

That military men are conservative admits of no doubt. Whether they are more so than civilians is beside the question. The important point is that their conservatism may be so dangerous that it is highly important that they should so train their minds in logical thinking as to eliminate, or at least minimize, this danger.

It will be useful to invite attention to certain instances of this defect that are recorded in the history of warfare, and also to certain recent instances that will show the influence it has exerted, and perhaps is still exerting, upon the minds of our contemporaries.

So strong has been the resistance to the general introduction of any new weapons or methods of warfare that one is almost forced to conclude that the military classes of all ages were all recruited from the Missouri of their respective countries. However this may be, it may be stated in general terms that most arguments in favor of fundamentally new weapons have failed except those that resulted in shedding the blood of the unbelievers; that defeat alone has been accepted as a final demonstration. The following are a few examples of the nature of the resistance in question, beginning with ancient times in order to show that this influence has been continuous, and that such conservatism as we retain at present is a legitimate inheritance from our naval forbears:

Bow vs. Sword and Mace

Considering, first, the most primitive weapons, there is no doubt but that the bow was a vastly more efficient instrument of warfare than the sword, the mace, or the pike; but almost without exception it was never accepted as a proper arm for the knight or warrior. The ancient wars were mainly fought with the sword and javelin, and both Greeks and Romans looked upon the bow as plebian. It was not until the decline of the Roman Empire that the bow was used to any large degree by the Romans, the victory over the Franks at Casilinum (A. D. 554) being won by the horse-archers.

The warriors of medieval Europe viewed the bow in the same way. Thus Charlemagne endeavored to dignify and extend its use by edicts and the establishment of schools of archery, but to little avail, for the bow remained, until supplanted by firearms, the arm of the inferior classes and the yeomanry.

The cross-bow was an advance over the bow in power and efficiency but it never became the predominant arm, although it was extensively used during the Crusades. In A. D. 1139, the Lateran Council condemned its use as a murderous weapon. This resulted in a partial abandonment of it as a mode of warfare. The attitude of the nobleman respecting the cross-bow is indicated by the action of Philip of France at the battle of Crécy (August 26, 1346), who rode down his Genoese cross-bowmen with the words, "Forward and strike down this useless rabble, who are thus blocking up the way in our front." But Crécy was won by bowmen, the English archers, who, unlike the Genoese, had kept their bow-strings dry, devastating the chivalry of France.

"A first-class English archer," said Prince Louis Napoleon, "who in a single minute was able to draw and discharge his bow twelve times with a range of 240 yards, and who in these twelve shots only once missed his man, was very lightly esteemed."

It would seem that there was for many centuries a settled prejudice against projectiles, or perhaps rather against the men who launched the projectiles, because it was considered that the these men required less courage than the wielders of short-arm weapons. This prejudice persisted for a considerable period even after the introduction of firearms.

Cannon vs. Pikes

Although gunpowder is said to have been discovered in Europe by Roger Bacon during the early years of the 13th century, it was not until 1338 that we have any account of the use of artillery. This was at the battle of Cambrai. Cannon are again mentioned as used in the battle of Quesnoy (1339). At this time, however, they were looked upon as curiosities more than anything else, and it was the general opinion of military experts that artillery would not supplant the sword and the pike.

In fact the pike or the lance was considered superior to the gun as late as the 18th century. We know that the Emperor of Germany changed his pikemen to musketeers in 1689, which led Louvois, the French minister, to propose a similar change in the armies of France. Louis XIV, however, while he confessed that he was impressed by the minister's arguments, said that he did not consider them strong enough to warrant such a great change. Pikes were not abolished in France until 1703. Incidentally, they were still supplied to our ships 180 years later.

Nor was our cloth less conservative as regards the introduction either of weapons or of methods of propelling war vessels. For example, it is apparent that oars were used more than sails in the sea battles of the ancients. The sail was mainly an auxiliary. The Egyptians, the Romans and the Greeks all trusted to the oar on account of its freedom from weather conditions. This attitude persisted quite to modern times; the battle of Lepanto (1499) was fought with galleys, and the Spanish Armada (1588) contained a great number of galleys.

Artillery did more to do away with the oar than anything else, for the guns occupied the positions of the oarsmen.

Steam vs. Sails

Also Mahan states in *From Sail to Steam*, that: "The parting with sails as the motive reliance of a ship of war was characterized by an extreme conservatism. Steam was accepted first as an auxiliary, for towing, etc. A man of unusual intelligence maintained that steam would never prevail over sail; the steamer 'broke down,' and owing to the fuel question could never be as self-contained as a sailing ship. Admiral Baudin, a Napoleonic veteran, was very sarcastic over the uncertainty of steamers."

Wilmot again states that: "The discovery that steam could be profitably utilized for the propulsion of ships, and the tardy adoption of the screw, did not for many years materially effect the construction of war vessels. Rear Admiral Sir William Symonds (director of naval construction), to whom I have alluded as effecting considerable improvement in the qualities of our sailing ships, had, as his biographer states, no love for steamers in any shape. . . . In a letter to Lord Auckland . . . . he states: 'I consider steamers of every description in the greatest peril when it is necessary to

use broadside guns in close action; not alone from their liability to be disabled from shot striking their steam-chest, steam-pipe, machinery, etc., but great probability of explosion owing to sparks from funnel.'"

Inventors have always had a hard time in convincing high naval officials of the merits of their inventions. It usually required pressure of war necessity or strong political influence, or both, to insure even a hearing. Fulton and Ericsson are cases in point.

Fulton and Ericsson

Fulton's *Demologos,* a steam-propelled floating battery, contained all the elements essential for a battleship today—positive and well-protected motive power, heavy battery, and impregnable armor, the latter five feet of solid wood; but naval officers insisted upon masts and sail and heavy bulwarks to protect those handling them.

In 1837-38 Ericsson was unable to gain recognition from the Admiralty, and in 1839 he returned to America and, under the patronage of Captain Stockton, one of the few officers who favored the use of steam, superintended in 1842 the building of the sloop-of-war Princeton ,the first screw steam vessel of war built in any country.

Barnaby states that: "There was the same prejudice against the adoption of iron for vessels as for the adoption of steam propulsion. Furthermore the opponents of armor were sufficiently entrenched to delay the adoption of these new ideas for years. Iron was first used in vessels in 1812, but it was not until 1834 that the British Admiralty began to make experiments in this field, and not until 1845 that an armored ship was produced by Laird."

The introduction of armor was opposed very strenuously for many years. Barnaby further states that: "In 1876 Admiral Sir George Elliott circulated a pamphlet designed 'to stop the useless expenditure by the Admiralty of vast sums of money on the ships ordered by them not because the ships were partially unarmored, but because they were armored at all. In that pamphlet he declared armor-clad ship-building to be the result of want of foresight. . . But he contended that the evidence of the superiority of the gun, and the developments of the efficacy of the ram and the torpedo had deprived us of sufficient excuse of late years to continue to fight the losing game of armor against guns."

Breech-loaders vs. Muzzle-loaders

The long and costly controversy over the adoption of breech-loading guns is too well known to require reference to more than the very significant fact that purely mechanical difficulties were constantly allowed to overshadow in importance the fundamental principle involved. Breech-loaders were installed in the British navy, replaced by muzzle-loaders, and reinstalled until their final adoption in the latter part of the 19th century.

But while ordnance experts were vigorously discussing the question as to the end of the gun into which the projectile would best be inserted, and were still blind to the profound influence the breech-loader necessarily would exercise upon the design of war vessels, they were no less strenuously resisting any improvements in the projectiles themselves. Some of their arguments are curious, and some amusing, particularly those concerning that great cost of the shells of that day. Thus Wilmot stated that:

"The old prejudice in favor of solid shot was not easily overcome. The latter were said to be more accurate, and to have greater range and penetration than hollow shell. Objections were also raised to putting too many shell guns in ships on account of the danger of accidental explosions.

"Another argument used against the introduction of projectiles was their cost. Sir Howard Douglas, in his work on Naval Gunnery says, 'The expense of shell equipment is enormous. The cost of every 8-in. shell in box is 11 s. 6 d., or $2.78, and each one fired costs 17 s. 4¾ d., or $4.17. (1838).'"

Having in the above account convicted the officers who were before our time of a degree of conservatism that was at least very dangerous to the success of their navies, the question arises as to whether the record of our contemporaries is any better. It is to a certain extent, because during the last fifty years we have become so accustomed to great advances in all mechanical appliances and scientific processes that it is hard to surprise us by anything new in these lines.

Two Significant Facts

It may be useful to invite attention to two very significant facts:

First, that America has been distinctly in the lead in originating many important features of naval design, and in the invention of types and weapons of fundamental importance I need cite as examples only the monitor, the submarine and the airplane. There are many others.

Second, that, generally speaking, our navy has lagged behind in the adoption and general application even of our own American improvements and inventions. Many of our inventors have had to go abroad for recognition.

Almost all controversies over questions of the adoption of new methods or weapons have had one perfectly natural feature in common: they have been contests between the younger men with their naturally more progressive minds and the more conservative seniors at the top of the list who had the power of decision. This has been as true in former times as it has been in our time; and moreover, it goes without saying that while in general such controversies have been based upon honest differences of opinion, sometimes strongly influenced by natural conservatism, still they were not free from the influences of our fallible human nature.

It is doubtless well known that in the past our navy vigorously resisted the introduction of steam propulsion, then reluctantly consented to auxiliary steam with full sail power, then to full steam with auxiliary sail power, and finally, but very tardily, gave up sails altogether. There was the same opposition to the introduction of armor, breech-loading guns, and other improvements of minor importance; and nothing but the extreme pressure of war necessity overcame the opposition to Ericsson's monitor. It is not necessary to review all of these phases of our navy's resistance, as they were similar in all respects to those already noted in the experience of the British and other navies; but it should be recorded that these controversies were fought out in some instances not only with extreme bitterness but with an apparent inability or indisposition to accept the plainest possible evidence.

All competent students of naval warfare have long since recognized the necessity of battle cruisers, particularly if our possible enemies possess them; but until recently our navy has failed to recommend them to the Congress, though for a great many years their value has been conclusively demonstrated on the game board.

The Case of the Submarine

The case of the submarine need be hardly more than mentioned. Though American designers of this type of vessel are responsible for most of the principles upon which its success depends, they received so little encouragement from our navy that not only was the first practical development in foreign navies, but even as late as our entry into the Great War, the capabilities of this type of vessel were seriously misunderstood.

The same is true to an even greater degree as regards the development of the airplane as a weapon. Even while foreign countries were appropriating large sums of money and were making every effort to develop it, our naval authorities were actually resisting its introduction.

These are only a few of the instances of the deadly effect of unreasoning conservatism. Many others could be cited in connection with practically every more or less radical departure in design, weapons, methods or appliances. Generally speaking, all such improvements have met with more or less effective resistance from those in authority; and the examples cited show that this resistance has been in certain important cases so very determined as to cause juniors to think twice before placing themselves definitely in opposition to their seniors; and it should be specially noted that the more important or fundamental the improvement advocated, the more strenuous and prolonged is likely to be the opposition, and consequently, the greater the danger of delay in giving it impartial and unprejudiced consideration.

It is by reason of this attitude that our navy found itself so absurdly deficient in markmanship during the Spanish war;

so deficient in destroyers, submarines and airplanes when we entered the Great War; and it is for this reason that we are still without battle cruisers.

The rapid development of the submarine and the airplane during the war, and the continuous development of both, and especially the latter, since the war, have shown that these powerful weapons are still in their infancy; that great possibilities of development are clearly in sight; and that it will require the most careful, devoted, and logical consideration upon our part even to keep abreast of the developments in foreign navies, much less to anticipate these developments.

Are we approaching the consideration of the influence of these revolutionary weapons in a judicial frame of mind? I am afraid not, in view of recent examples of minds absolutely closed to the plainest facts. In spite of adequate experiments clearly showing that airplanes could make a certain percentage of hits upon ship targets, a secretary of the navy expressed his disbelief in the ability of bombing planes to injure a vessel by affirming his willingness to stand upon the bridge of the Ostfriesland during the proposed bombing experiments. It is of course not remarkable that a civilian should have made such a statement; but it is very significant that this statement was based upon similar statements by naval advisers who were suffering the blighting influence of conservatism to an extent not exceeded by that of any of the examples just cited from history and from recent experiences.

So great indeed was the unwillingness to admit anything at all to the disadvantage of the battleship that many of our senior officers solved the difficulty for themselves by simply denying all the claims made by the airmen. For example, a captain on duty at the Navy Department expressed the opinion that a battleship can shoot down planes as fast as they attempt to get into bombing position; that even unopposed bombers could not hit a vessel underway; and in any case that bombs would not do much damage; that a bomb exploding on the protective deck would not penetrate below if it contained less than 3000 lb. of T.N.T.

Our navy has in our own time passed through periods of great danger. At the battle of Santiago we made but three per cent of hits at ranges shorter than are ever likely to occur again; and so inefficient was our gunnery up to 1900 that an equal force of ships of any efficient navy could have inflicted upon us a most humiliating defeat.

In my opinion we are now entering a period that may become still more dangerous if we fail correctly to interpret the significance of the rapid development of fundamentally new weapons of enormous destructive power and of relative immunity to effective resistance by any means except a decisive superiority of similar weapons.

Standard Engines of the Air Service

In the course of the discussion in the House of the Army appropriation bill on March 24, Representative Roy G. Fitzgerald of Ohio read the following letter from Maj. Thurman H. Bane, Chief, Engineering Division, A. S., dealing with the aeronautical engines required and developed by the Air Service:

My dear Mr. Fitzgerald:—Referring to your inquiry of March 17, I regret that the Appropriations Committee gathered the impression that the Air Service is developing too many aircraft engines. The facts are, we are limiting our development to the bare necessities of the Service. Of course, different engines are required for different purposes, and the science of engine design is advancing rapidly, and we must keep abreast.

Types Required

We require the following types of engines for the purposes indicated:

1. Training of fliers: Reliable durable engines of 150 to 200 hp.
2. Light pursuit for alert work: Radial air-cooled and small V engines, water cooled, of 200 to 240 hp.
3. Heavy pursuit: Light, high performance, compact engines of 300 to 400 hp.
4. Corps observation and various other two-seated airplanes: Reliable, durable, smooth-running, economic engines of 400 to 550 hp.
5. Heavy bombardment and heavy ground attack: Reliable, durable, long-lived, economical engines from 600 to 1000 hp.; the higher the horsepower the heavier the load of bombs and armor plate that can be carried.

To fill the above requirements we have already developed the following engines for each class of work:

1. Training: (a) The Wright 180 hp., model E2, V-type water-cooled engine. (b) The Lawrance radial air-cooled 180 hp. model J1.
2. Light pursuit: The above training engines are used with minor modifications to increase volumetric efficiency, which modifications can be made in field.
3. Heavy pursuit: (a) The Wright 300 hp., V-type, 8-cylinder, water-cooled, model H3, engine. (b) Packard, 300 hp., V-type, 12-cylinder, water-cooled, model 1237, engine.
4. Corps observation: (a) Liberty, 400 hp., 12-cylinder, V-type, water-cooled, model 1921, engine. (b) Packard, 550 hp., 12-cylinder, V-type, water-cooled, model 2025, engine.
5. Heavy bombardment: McCook Field, 700 hp., 18-cylinder, W-type, water-cooled, engine.

Types Developed

In order to keep the United States abreast of the rapidly advancing science of aircraft engine design the development of the following engines has been started and must by all means be pushed to prompt completion if this country is not to lag in this field, which basically controls aircraft performance:

1. Pursuit: (a) Curtiss, 375 hp., 12-cylinder, V-type, water-cooled,engine; the most compact water-cooled pursuit engine of this power yet conceived. (b) No satisfactory air-cooled high-powered engine is yet in existence, notwithstanding the extravagant claims of foreign designers. The Wright 350 hp. radial air-cooled, model R1, engine is under development and shows great promise.
2. Heavy bombardment: McCook Field, 1000 hp., 18-cylinder, water-cooled, engine.

It should be noted that all the above engines are designed along fairly conventional lines. The Air Service, however, cannot overlook the possibilities of suggestions made by commercial concerns which depart from standard practice and which appear to have promise; such a suggestion is the Almen, barrel-type, 375 hp. pursuit engine. This engine is a distinct departure from conventional practice, being composed of a barrel-shaped engine with nine cylinders on each end horizontally placed. This engine offers possibilities in improving airplane performance due to its compactness, light weight per horsepower, small frontal area, and freedom from vibration.

There is a possibility that air-cooled engines will ultimately replace water-cooled engines for aircraft. We are therefore paralleling the development of water-cooled engines, the science of which is fairly well established with the development of similar air-cooled engines where possible. This situation might account for the fact that the Appropriations Committee thought that we, perhaps, were developing too many types.

In addition to the above engine development we are vigorously pushing the development of superchargers to enable us to reach much higher altitudes with our airplanes.

Respectfully,

THURMAN H. BANE,
Major, Air Ser., Chief Engineering Div.

The Uses of Airplane Carriers

Naval Air Operations Demand that Airplanes Be Put into the Air in Any Kind of Weather

The plans of the Navy Department to convert some of the battle cruisers which have been ordered scrapped by the Washington Conference, into airplane carriers makes the subject of their employment of great interest at this time.

So that the point of view of the Navy may be understood, a well informed naval officer has given AVIATION *the main advantages of the airplane carriers.*—EDITOR.

The organization for naval air operations requires that many squadrons of airplanes can be put into the air at short notice, and naturally arrangements must be such that this can be done as promptly in a gale of wind as in fair weather. Airplane carriers answer this purpose because they are the only means by which airplanes may be used with the fleet in sufficient numbers and in all kinds of weather.

Airplane Carrier is Floating Airdrome

Airplane carriers not only carry at sea a large number of planes—in other words, a much larger number than can be carried on the present type of ships—they also provide a means for getting them back after they have taken the air. Even if it were practicable to have planes land on the water alongside of a ship, with the idea of picking them up by means of a derrick, it must be remembered that in time of war the ships at sea must go at the maximum speed, and also zigzag. It would be impracticable to pick up an ordinary boat under these conditions, and more impracticable to pick up a delicate airplane.

The radius of action of all planes, including bombers, is very limited, and bombing planes have to be protected by fighters. The airplane carrier is thus a large floating, mobile airdrome. It differs radically from the ordinary airdrome in that it is a means of putting into effect the offensive qualities of aviation, on which so many claims are being made, including a great many extravagant ones. The bombing of ships from shore, provided the ships come within the radius of action of land planes, is perfectly feasible and easy, but before this, the land plane, or whatever type of plane is used, must have a base from which to operate, at least in the present state of development of aviation.

A plane can take the air from the deck of a ship—using a catapult if the available length for take off is short—no matter how bad the weather may be. But a seaplane can take the air from the surface of the water only when the sea conditions are favorable; the sea must be smooth enough for the plane to be able to work up to flying speed while running on the surface. This means a water speed usually greater than the speed of the fastest trans-Atlantic steamer; consequently we cannot hope to improve matters very much by increasing the size of seaplanes; it is well known that the state of the sea frequently forces the largest steamers to slow down.

Developed by Practical Experience

The airplane carrier has been developed by practical experience in naval air operations. At first, in the late war, seaplanes were carried on tenders from which they were hoisted overboard to take the air from the surface of the water. Used in this way the airplane was naturally unpopular with the Navy, for, as explained above, it was of necessity a fair weather apparatus. The next step was to put airplanes with wheels on extemporized platforms built on tops of turrets of the fighting ships; this was a step in advance because the planes taking off from the platforms did not have to wait for smooth sea conditions, and consequently could operate in bad as well as good weather. But in this kind of operation, there was no satisfactory means of recovering the planes after flight, and there was not enough available space for platforms to permit operation of a sufficient number of squadrons. The next step was the carrier with a flying-on deck as well as facilities for flying off the deck. The use of carriers made it possible to increase the number of planes operating with the fleet, and make it possible to recover planes after they had finished their flights.

Catapult Supersedes Flying-off Platform

In the United States Navy the flying-off platforms on turrets have been superseded by catapults which permit operation of more efficient planes from the fighting ships than was possible from the platforms. The length of run on the catapult is about the same as with the turret platform, but the mechanism of the catapult assists the plane to get up flying speed in the short run; consequently we can now use much faster or heavier planes than was possible with turret platform. The catapult also makes it possible to use planes on all types of ships, whether there be provision for this purpose or not.

Resuming it may be said that the airplane carrier is simply a means of furnishing transportation for planes over the sea, instead of restricting them to operations within a few miles of the shore. The putting of catapults aboard, and the placing of planes on ships, necessarily of a restricted number, is well enough, and in doing it the Navy is doing the best it can with the means at hand. It is believed that battleship design will ultimately be radically modified so that they carry fewer guns, and the number of guns sacrificed will give a part of the deck space to planes, and re-arranged so that they can carry a greater number of planes. All wars are settled by gaining control of the sea, and this control is in the ultimate analysis generally gained by a fleet action, so that one must think of aviation as taking a role which in its own province, must on a very large scale, be decisive. Hence in order to carry planes in large numbers the airplane carrier is essential.

"Currenium" -- What Is It ?

Newspaper reports announce the production in Los Angeles of a new lifting gas, called Currenium, which, it is claimed, is non-explosive and non-inflammable, and for which the further claim is made that its lift is essentially that of hydrogen.

In this connection George B. Harrison, formerly secretary of the Aero Club of Southern California, has favored us with the following communication, which is published for the sake of information.

"Currenium, a new gas which is non-explosive and non-inflammable and which can be manufactured cheaply has been developed by the International Transportation & Manufacturing Co. It is the discovery of Dr. E. Curran, Chief of the Research Department of that company. He has been experimenting for more than twenty years to devise a means of producing a non-inflammable lighter-than-air gas, and in 1918 practically perfected such a process. Since then he has been developing the method of quantity production of the gas in order to attain a low priced method of manufacturing with the assurance of constant purity.

"A lift equal to that of 98 per-cent hydrogen is claimed for the new gas, with a much better maintenance of purity than is possible with hydrogen. Dr. Curran has kept the gas in an airship compartment of his own design for more than a year without noticeable loss of purity. He asserts that the gas may be manufactured at less than $40.00 per 1000 cu. ft, and that its production is feasable wherever machinery can be installed.

"Tests of Currenium have been made at Los Angeles, which were witnessed by members of the Aero Club of Southern California and of the Commercial Aircraft Association of Southern California, in which a flame and electric spark were introduced into the gas without causing fire or explosion, and after which small balloons were filled to demonstrate its buoyancy. The actual lift of the Currenium is almost that of hydrogen, but better than helium."

Full Scale Seaplane Coefficients

Lift and Drag Coefficients of Brandenburg Seaplane Determined in Free Flight Tests

By Max M. Munk

The free flight tests described in this note were made by the author and Dr. Erich Hueckel at the testing station at Warnemuende during the summer of 1918, and are here published for the first time. It was intended to develop a simple method for the examination of the aerodynamical properties of a seaplane independent of the characteristics of its propeller. The instruments had to be simple and self-recording, and no long preparation of the airplane for the test could be allowed. On the contrary, the instruments had to be mounted in the airplane only a short time before the beginning of the test. The method was used with one airplane only, and the opportunity was taken to determine its lift and drag coefficients and the propeller efficiency.

The seaplane used for these tests was a German Brandenburg sea-biplane with the following characteristics:

Span, 36 ft. 9 in. and 34 ft. 5½ in.
Entire wing area, S, 380 sq. ft.
Entire weight, W, 3200 lb.
Two floats, two pairs of struts.
Propeller diameter, D, 9 ft. 2¼ in.

The Instruments Used

The instruments used for the tests were a chronograph and an ordinary barograph. The first instrument was similar to a Morse telegraph receiver; a paper strip about 1¼ in. broad, moved with a velocity of about 7 in. per minute under four needles which, when under the influence of four independent electromagnets, marked the paper without stopping its course. The needles were controlled respectively by an ordinary clockwork, by the flexible shaft of the revolution counter of the engine, by an anemometer of the Robinson type and by hand. The clock gave electrical contacts at intervals of 12 sec., the shaft leading to the revolution counter always after 26 revolutions of the shaft, corresponding to 52 revolutions of the engine. The anemometer gave contact after each 180 ft. of travel of the airplane approximately. The fourth needle was operated manually by the observer when the altimeter had reached certain points It was intended to operate the fourth needle automatically too at later tests, making it indicate the density of air. Readings were also made of a thermometer, but the greatest part of these could not be used, for it appeared subsequently that the thermometer was too near to the exhaust. The density therefore had to be calculated. This was done by means of the formula $\rho = \frac{1}{8}\, 0.9^h$ kg. sec^2 m^{-4}, where h denotes the altitude in kilometers as indicated by the altimeter.

Gliding Tests

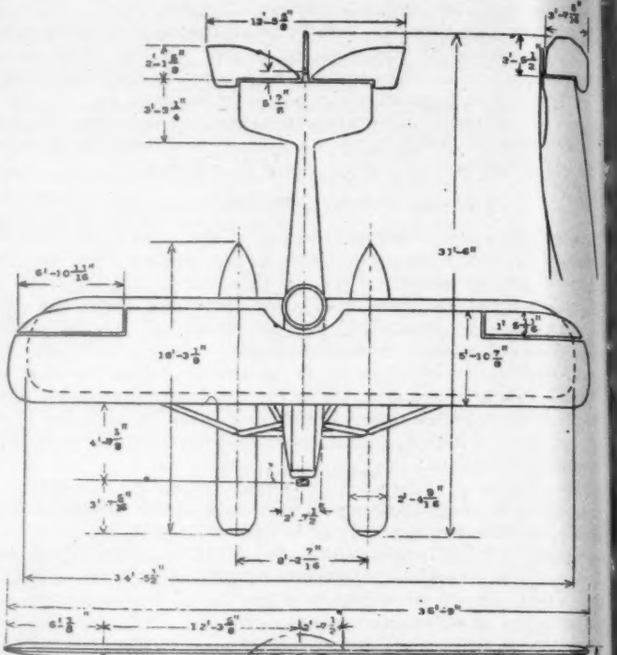
The pilot controlled the airplane so that the dynamic pressure as indicated by the pitot tube was nearly constant. The velocity decreases then during the dive and the negative acceleration of the airplane is to be taken into account in the computation of the final results. The path is slightly curved too, but the centrifugal force is neglected in this paper. Let w denote the vertical velocity and V the total velocity, and let the angle ε be defined by the relation $\sin \varepsilon = w/V$. The slope of the path then is taken into consideration if the usual formula for the power is replaced by the following formula

$$\frac{C_a}{C_1^{3/2}} = -\frac{w}{\cos^{3/2}\varepsilon}\sqrt{\frac{S}{W}\frac{\rho}{2}}$$

which for small angle ε assumes its ordinary form.

C_1 is calculated from the formula $W = C_1\, q\, S$ and, on substitution in the preceding formula, C_a is deduced.

All instruments were carefully gaged before each test; the weight of the airplane was deducted for each test by taking into account the weights of the pilots and the estimated consumption of fuel. The table at the end of the note gives the mean values obtained from each series of tests.



Outline drawings of the Brandenburg seaplane

Tests with Running Engine

The horsepower of the engine was assumed to be

$$N = \frac{n}{n_0}\,\frac{\rho - .015}{.125 - 0.15}\,N_0$$

where N_0 is the power delivered at the normal number of revolutions n_0 and at the density of the air 0.125 kg. sec.$^2/m^4$, and ρ is the density of the air in the same units.

The mean results are contained in the accompanying table. The efficiency of the propeller was deduced by making use of the drag coefficients obtained by the gliding tests; the drag of the propeller for the stationary airplane determined by a model test, being subtracted.

The efficiency thus obtained includes the loss involved by the mutual influence of propeller and airplane, consisting of an increase of the drag, which in general is not wholly neutralized by the increase of the propeller thrust. That is, the efficiency is

$$\frac{C_a\, S\, q \quad V + u\, W}{\text{Brake horsepower}}$$

where u denotes the vertical component of the velocity. This

absolute efficiency is different in general from the original efficiency of the isolated propeller.

Table.

	Gliding tests						Engine running			
No.	1	2	3	4	5	6	7	8	9	10
Velocity mi./hr.	73	80	101	66	72	69	69	83	72	67
Vertical velocity ft./sec.	−16.1	−21.8	−35.6	−13.4	−16.0	−15.6	2.2	0	−4.3	2.5
Dynamical pressure lb./sq. ft.	12.1	15.2	24,2	9,5	12.3	11,8	10,6	15,0	11,5	9,8
C_l	.67	.51	.32	.81	.65	.68	.79	.51	.68	.90
C_d	.10	.10	.09	.11	.10	.11	.095	.082	.090	.10
C_a propeller drag subtracted	.085	.085	.075	.095	.085	.095				
Propeller efficiency Per Cent							63	71	68	55
$V/_nD$							.48	.54	.48	.45

—*N.A.C.A. Technical Note*

German Air War Plans

The following is a translation of an article by Lieut. Colonel Reboul of the French Army, which appeared in a recent issue of the French daily *Le Temps*:

The Ministry of War of Germany has just published regulations which enlighten us on the state of mind of the German High Command and its designs. The "Instruction on the employment of aviation to be used for maneuvers, regimental exercises and drills in tactics" is a statement in concise form of the opinions of the German High Command on the employment of aviation during the war.

Article 198 of the Treaty of Versailles prohibits Germany from keeping any air force whatever. This, however, does not prevent the Minister of War from declaring in this instruction: "In the distribution and employment of the aviation formations we have taken as a basis a modernly equipped army for use in giving decisive combats." It does not prevent the cadres of the Reichswehr from already undergoing training in the use of the airplane. In their kriegspiele they assign missions to it and receive information from it. They are accustoming themselves to handle it, to consider it as an arm, the collaboration of which is indispensable. They are making preparations to use aeronautics in connection with the other arms.

Doubtless the Reichswehr will be unable to begin the actual exercises so long as our control commissions remain in Germany. But the day they leave, the "Instruction on aviation" will immediately be put into effect. The plan being already known to all, it would require but a short time to put it into operation and have an air force working in close union with its command, its infantry, its artillery and its cavalry.

Chapter II of the regulations treats of the aerial formations. It provides for an exceedingly high aviation equipment for each large unit.

The Infantry division includes organically a strong squadron of two escadrilles. One of these, the reconnaissance escadrille, will be used for close missions and for observation of the battlefield. The other will work with the divisional artillery. Each of these escadrilles comprise twelve airplanes. The German army thus realizes the desiderata which we expressed at the end of the campaign of 1918. The division is henceforth permanently equipped with its eyes and observers. Its aviation will work constantly with the same units. They know one another wonderfully well; they have confidence in one another; they conform to one another's customs and idiosyncrasies. The results will be incomparably greater than those obtained with escadrilles that are assigned only temporarily to the divisions. At the moment that everyone begins to speak the same language the escadrille is replaced by a new one. Everything must be begun all over again.

The army corps has its own squadron which has the same composition as the divisional squadron. Its reconnaissance escadrille will specialize in photography and in night reconnaissance; its artillery escadrille will regulate the heavy artillery firing of the army corps.

The army is very strongly equipped with aviation units. The regulations provide for the assignment to it of one observation squadron, combat squadrons, pursuit squadrons and bombarding squadrons.

The observation squadron is of the same type as the divisional squadron; but its airplanes will as a rule be superior. They will, in fact, penetrate more deeply into the enemy lines. The reconnaissance escadrille will make distant reconnaissances and photographs of the enemy's rear areas. The artillery escadrille will regulate the fire of the high powered heavy artillery which will be directed against the enemy quarters, its parks, railways installations and points through which it is compelled to pass.

Each army in active operations has assigned to it a combat unit with a strength of three or four squadrons. Each squadron comprises four escadrilles of twelve airplanes each. This represents a body of 150 to 200 airplanes which will have as its mission to take part in all the phases of the battle, both in aerial combats and in combat against the other arms. In an attack it will act with the assaulting troops, will precede the first waves, mowing down the enemy reserves and bombarding the centers of resistance.

The pursuit unit will be especially charged with the aerial fighting. It comprises from four to six pursuit squadrons, each squadron comprising three escadrilles of twenty-one planes. Its mission is to hinder the enemy reconnaissance and prevent the enemy combat aviation from taking part in the battle. It must enable its own reconnaissance airplanes to accomplish their mission. Its object is aerial combat. Pursuit planes should act in mass so as to be master of the air, at least during certain hours. They may be reinforced for certain missions by combat and bombarding squadrons.

The bombing aviation is less strong numerically than the combat and pursuit aviations. It consists of from one to three squadrons, each formed of three escadrilles of twelve planes. It is to be used in bombarding by day as well as by night.

The group of armies has only a very limited air force, which consists of one escadrille of twelve planes for making reconnaissance which are of special importance to it and which it wishes to entrust to observers whom it knows and can rely upon, and one artillery escadrille of twelve planes for the long-range and very mobile guns, especially those on railways, which it fires now in one direction, now in another.

The General Headquarters reserves a few combat and pursuit squadrons both for its own safety as well as for an aerial reserve. It will itself conduct the fighting against vital points in the enemy's back areas by means of bombing squadrons and giant airplanes which it will bring into action.

Such are the provisions of the German Minister of War for the formation of his future air forces and for their employment in another war with another great military power, that is, with us. This instruction on the employment of aviation is ample proof that Germany has but one thought: revenge.

Sale of Hangars and Castor Oil

The Chief of Air Service notifies that sealed proposals for the purchase of a number of airplane hangars will be received in the Material Disposal and Salvage Section, Office of the Chief of Air Service, Room 2624, Munitions Building, 20th and B Streets, NW, Washington, D. C., until 3 p. m. (eastern time), on Monday, May 8, 1922. This material, which is located at the Aviation General Supply Depot, Morrison, Va., comprises (a) twenty Alban Richards type B portable hangars, complete with canvas covering, span 130 ft., height front 25 ft., depth 60 ft, height rear 20 ft., total weight approximately 51,450 lb. each; and (b) forty-nine Alban Richards type A portable hangars, minus canvas covering, span 72 ft., height front 16 ft. 4 in., depth 48 ft., height rear 8 ft. 4 in., total weight approximately 11,995 lb. each.

Prospective bidders can inspect detailed blueprints of these hangars in the office of the Chief of Air Service, where detailed information as to conditions and terms of sale are also to be had on application.

The Material Disposal and Salvage Section also invites bids on a lot of castor oil stored at the Air Intermediate Depot, Fairfield, Ohio, in which is included among others a lot of 7150 gal. of castor oil packed in steel drums of 50 gal. capacity. Bids close on May 9, 1922.

"Who's Who in American Aeronautics"

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The biographical sketches of men who are prominent in American Aeronautics are printed periodically in AVIATION. The first series will be shortly published in a more durable form, and revised issues will be published semi-annually to take care of the frequent changes in station of Army and Navy officers, and such other changes as may occur. As errors and omissions are liable to occur in a compilation of this character, interested parties are requested to notify "Who's Who" Editor of the necessary corrections so the record may be kept up to date.

Walter Joseph Smith

SMITH, WALTER JOSEPH, Air Mail Pilot; born, Huron, S. D., April 9, 1893; son of Horace G. Smith and Fannie (Howe) Smith; married, Zita Walsh, Feb. 16, 1920.

Educated: Public schools of Pierre, S. D.; Banking and Accounting, and Law school.

Professional: Cashier, C. & N. W. Railroad to Aug. 1916.

Aeronautical Activities: Princeton School of Military Aeronautics; Cadet overseas, trained at Avord, France also Tours and Issoudun; assigned to 24th Aero Squadron, A.E.F. at the front, Aug. 1918 to Armistice.

Flying Rating: French Brevet No. 11889, March 6, 1918.

War Service: 24th Aero Squadron, Aug. to Nov. 1918, Meuse-Argonne Offensive.

Honors: Credited with destruction in combat of one enemy plane.

Member: U. S. Air Mail Pilots of America; American Legion.

Present Occupation: Pilot, U. S. Air Mail Service

Address: 307 N. Oak Park Ave.; Oak Park, Ill.; home, Pleasent Drive, Pierce, S. D.

Earl W. Hutchison

HUTCHISON, EARL W., Chemist; born, Buffalo, N. Y., Sept. 1, 1892; son of Robert Hutchison and Elsie (Bolza) Hutchison.

Educated: Northside High School, Pittsburgh, Pa.; B.S. 1916, University of Wisconsin.

Professional: Carnation Milk Co. until Aug. 13, 1917; Barber Colman Co., Rockford, Ill., Sept. 1919 to Jan. 1920, assistant to metallurgist and chief chemist.

Aeronautical Activities: Began training, April 1918 at Tours, France; Issoudun and St. Jean de Monts Gunnery Schools; 50th Squadron, Jan. to April 1919, 186th Squadron, April to July 1919.

Flying Rating: Reserve Military Aviator.

War Service: Aug. 1917 to Aug. 1919, U. S. Army Air Service.

Member: American Chemical Society.

Present Occupation: Chemist.

Address: 42nd St., Kedzie Ave., Chicago, Ill.; home, 218 Langley St., Pittsburgh, Pa.

Elbert Ezra Wilson

WILSON, ELBERT EZRA, Attorney at Law; born, Winston Salem, N. C., Jan. 18, 1895; son of Samuel Branson Wilson and Frances (Bailey) Wilson.

Educated: Dell High School, N. C.; Ecole Militaire, St. Maixent, France; Academician Marylan Academy of Science, 1911, LL.B., Wake Forrest College, 1920.

Aeronautical Activities: School for Aerial Observers, Ft. Sill, Okla., 1917; Mitchell Field, L. I., 1918; Camp Woodley, England, 1918; First Corps School, Gondrecourt, France, Feb. and March 1918; Commanding Officer of 4th Art. Aero Observers School, Meucon, France, May 10 to June 29, 1918.

Flying Rating: Observer.

War Service: World War, May 1917 to July 1919.

Member: American Legion; Veterans of Foreign Wars.

Present Occupation: Attorney at Law.

Address: 505 Wachovia Bldg.; home, 110 Dalton St., High Point, N. C.

Chandler Smith

SMITH, CHANDLER, Broker; born, New York City, Jan. 6, 1867; son of Chandler Smith and Mary Elizabeth (Burbeck) Smith; married, Alla Halcyone Doughty, Jan. 3, 1900.

Educated: Public schools of New York.

Professional: Stock Broker.

Aeronautical Activities: Graduated, Adjutants' School, Ohio State University, March 23, 1918; Scott Field, in command 262nd Aero Squadron; Officer in Charge, School for Ground Officers, Valparaiso, Ind.; Captain, Company B, Military Training Camp, Valparaiso University, 1918-1919.

Member: Aero Club of America; Army and Navy Club.

Present Occupation: Broker; Capt. AS-ORC, C.O. 31 Airdrome Co.

Address: 41 E. 42nd St.; home, Staten Island, New York.

Whitman Hill Lenoir

LENOIR, WHITMAN HILL, Planter; born, Prairie, Miss., Oct. 6, 1892; son of William Smith Lenoir and Julia (Paine) Lenoir.

Educated: Aberdeen High School; Branham and Hughes Prep. School, Spring Hill, Tenn.; Vanderbilt University, 1914.

Professional: Actively engaged in operating planting interests.

Aeronautical Activities: Ground training, S. M.A. Austin, Tex. and Camp Dick, Nov. 1917 to March 1918; primary and advanced flying training, Park Field, Post Field and Taliaferro Field, March to Sept. 1918; Instructor in aerial gunnery, S.A.G., Taliaferro Field, Sept.-Nov. 1918; Air Service Depot, Garden City, L. I., N. Y., Nov.-Dec. 1918.

Flying Rating: Reserve Military Aviator and Pilot Gunnery Instructor.

War Service: U. S. Army, Nov. 1917 to Dec. 1918.

Member: American Legion; Aero Club of America.

Present Occupation: Planter.

Address: Prairie, Miss.

George Gleason Bogert

BOGERT, GEORGE GLEASON, Dean, Cornell Law School; born, Scotland, S. Dak., June 13, 1884; son of Taylor O. Bogert and Jeanette G. Bogert; married, Lolita E. Metzger, April 6, 1918.

Educated: Gouverneur High School, Gouverneur, N. Y., 1902; Cornell University, A.B., 1906, LL.B., 1908.

Professional: Practiced law, Elmira, N. Y., 1908-1911; taught law, Cornell University, College of Law, 1911-1921; Dean, College of Law, 1921 to date.

War Service: Capt., F.A., Aug. 15, 1917; Maj. and Lieut. Col., J.A.C., Nov. 1917 to June 1919.

Author: Sale of Goods in N. Y. (1912); Trusts (1921); Problems in Aviation Law (1921); Proposed Uniform State Aviation Law (1921).

Present Occupation: Dean, College of Law, Cornell University.

Address: Boardman Hall, Cornell University, Ithaca, N. Y.; home, 711 E. Seneca St., Ithaca, N. Y.

George L. Bumbaugh

BUMBAUGH, GEORGE L., Balloon Manufacturer; born, New Castle, Pa., Jan. 7, 1876; son of Jacob Bumbaugh and Margaret Bumbaugh; married, Cora M. Abbott, Oct. 11, 1900.

Educated: Public schools of New Castle, Pa.; Grove City College.

Professional: Occasional parachute leaps 1898 to 1912; constructed 110,000 cu. ft. balloon 1908; made 4 balloons for Illinois Aero Club, 1907; gave exhibitions with 60 ft. airship 1906-1912; manufacturing balloon equipment for Army and Navy, 1917-1920.

Flying Rating: Spherical Balloon License, No. 21; Aviators Certificate No. 601; Dirigible Balloon License No. 125.

Member: Aero Club of America.

Present Occupation: Manufacturing Balloon Equipment and Aerial Advertising.

Address: 838 W. D. Woodruff Place, Indianapolis, Ind.

Arthur Gottfred Johnson

JOHNSON, ARTHUR GOTTFRED, Farmer; born, Ludlow, Pa., April 8, 1893; son of Andrew J. Johnson and Hannah Johnson.

Educated: Public schools.

Professional: Farmer.

Aeronautical Activities: Ground School, Aug.-Oct. 1917; 3rd A.I.C., Nov. 1917 to Jan. 1918; Oct.-Dec. 1918, Ferry Pilot; Jan.-Feb. 1919, with American Committee to negotiate Peace at Paris.

Flying Rating: Reserve Military Aviator, May 1918; Brevetto Superioro, Aero Club d'Italia, No. 2661.

War Service: May 1917 to March 1919.

Member: Aero Club d'Italia; America Legion.

Present Occupation: Farmer.

Address: Box 36, Culbertson, Nebr.

Charles Rudolph D'Olive

D'OLIVE, CHARLES RUDOLPH, Insurance; born, Suggsville, Ala., July 10, 1896; son of Rudolph D'Olive and Leila (Whisenhunt) D'Olive.

Educated: High Schools of Hattiesburg, Miss.; B.S. in E.E., 1916, Mississippi Agricultural and Mechanical College.

Professional: Southern Bell Telephone Co., 1916; Assistant Engineer, Underwriters' Laboratories, 1919-1921; Superintendent, Label Service, Underwriters' Laboratories, Sept. 1921 to date.

Aeronautical Activities: Army, April 6, 1917 to Oct. 30, 1917; Cadet, Memphis, Tenn., 4th School Squadron; commissioned 1st Lieutenant, A.S.S.O.R.C,, Oct. 30, 1917; July 1917 to Nov. 1917 stationed at Chanute Field.

Flying Rating: Reserve Military Aviator.

War Service: 3rd A.I.C., Issoudun, France, Dec. 15, 1917 to Aug. 20, 1918; joined 93rd Pursuit Squadron, Aug. 25, 1918; flew offensives of St. Mihiel and Meuse-Argonne; made Flight Commander, 141st Squadron, 4th Group, Nov. 1, 1918; discharged Feb. 4, 1919.

War Honors: Distinguished Service Cross; citation; officially credited with the destruction of four enemy planes.

Member: Aero Club of America.

Present Occupation: Superintendent, Label Service' Underwriters' Laboratories.

Address: 207 East Ohio St.; home, 7233, N. Hilldale Ave., Chicago, Ill.

Grenville T. Keogh

KEOGH, GRENVILLE T., Automobile Business; born, New Rochelle, N. Y., Nov. 5, 1897; son of Martin J. Keogh and Katharine E. Keogh; married, Mary Pallin, Sept. 10, 1920.

Professional: Manager, Engine Department, Fairbanks, Morse & Co.; Trucking Department, Standard Oil Co.; Service Manager, Renault Automobile Co.; Service Manager, Hurlburt Truck Co.

Aeronautical Activities: 1200 hours in the air with the French Army; Test Pilot after the war for Standard Aircraft Corp.

Flying Rating: Pursuit Pilot.

War Service: Two years and three months in the French Army as Pursuit Pilot.

War Honors: Decorated four times with Croix de Guerre.

Member: Aero Club of America.

Present Occupation: Hurlburt Truck Co.

Address: 134th Street and 3rd Ave., New York City; home, 25 Neptune Road, New Rochelle, N. Y.

George M. Myers

MYERS, GEORGE M., Retired Capitalist; born, New York City, Nov. 25, 1855; son of Philip Myers and Margaret (Mulchi) Myers; married, Laura V. Boyd, Sept. 1, 1880.

Educated: High School.

Professional: Telegraph operator, Lake Shore & Michigan Southern Railroad, 1870; Western Union Telegraph Co., Kansas City, 1875; organized Pacific Mutual Telegraph Co. and Commercial Telegraph Co.

Aeronautical Activities: Governor, Aero Club of America for several years; organized Kansas City Aero Club, 1906, president; was leading spirit in International Balloon Race, Kansas City, 1911.

Present Occupation: Vice Pres., Automatic Sprinkler Co. of America.

Address: 506 New England Bldg., Kansas City, Mo.; home, 633 East Armour Blvd., Kansas City, Mo.

I. A. Morberg

MORBERG, I. A., Engineer; born, on board vessel entering U. S. A., May 19, 1892; son of H. J. Morberg and Elizabeth (Anderson) Morberg; married, July 8, 1914.

Educated: Public schools; technical school (Lewis Institute, Chicago, and Noerkoping Technical Institute, Sweden).

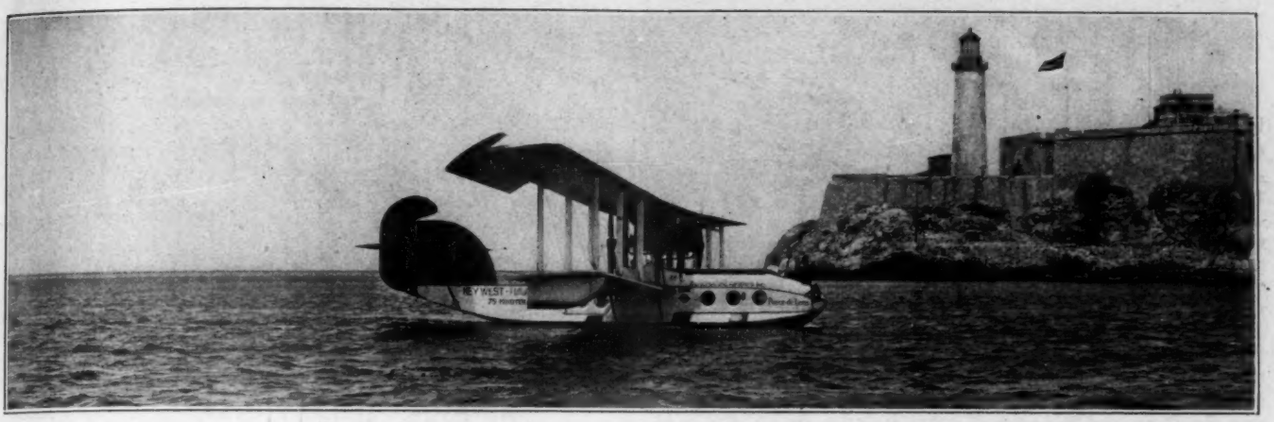
Professional: Design of Rotary Engine; test and assembly of LeRhone engines on government contract during 1918 at U. S. & S. Co., Swissvale, Pa.; assembly and test of Lycoming engines at Williamsport, Pa., 1919-1920.

Present Occupation: Western Electric Co.

Address: 4836 Dakin St., Chicago, Ill.

Aeromarine Airways Statistics

Aeromarine Airways have just furnished the Bureau of Aeronautics, Navy Department their second half-yearly report on the operations of their flying boats in the commercial transportation of passengers and merchandise in Southern waters. The report which covers the period commencing Nov. 15, 1921, and ending March 15, 1922, shows that out of 740 flights undertaken according to schedule all but five were completed, the defaulted flights being due to weather conditions, the boats in these cases returning to their starting point. The total number of passenger miles covered in these flights is 268,535, and the total number of hours flown 640. Not a single passenger or employe was injured during these flights. The types of flying boats used in these operations were the 11-passenger F5L, the 5-passenger HS2L, and the three-seater Aeromarine model 50.



(c) Aeromarine Airways

The 11-passenger flying cruiser Ponce de Leon of the Aeromarine Airways before Morro Castle, Havana. Note the black tail of the boat—the house mark of this air line

The following tabulation gives the details of the operations carried out by the Aeromarine Airways for the period indicated:

AEROMARINE AIRWAYS OPERATIONS, NOV. 15, 1921, TO MARCH 15, 1922

No. of flights:	
Key West-Havana	171
Key West-Miami	49
Miami-Bimini	91
Miami-Nassau	49
Miami-Palm Beach	16
Miscellaneous	359
Total no. of flights	735
Flights defaulted	5
Hours flown	640
Passenger-miles	268,535

These figures added to those of the first annual report of commercial flying operations submitted to the Navy Department on Nov. 12, 1921, show that in the operations of the Aeromarine Airways flying boats have flown an aggregate distance of over 150,000 miles, and have carried a total of 10,700 passengers without a single mishap.

Radio and Aircraft

Radio in its relation to aircraft was the subject of a talk by Jack Bins, Radio Editor of the New York *Tribune* at the semi monthly luncheon of aeronautical executives held at the Café Boulevard, New York, April 7.

Mr. Bins will be remembered as the radio operator whose heroism in the disaster of the S. S. Republic some twelve years ago saved the lives of a large number of passengers. Radio telephony, said Mr. Bins could be the most practical application of wireless in commercial aeronautics. He explained a newly developed duplex system by which the receiver in an airplane could interrupt the sender's conversation. Mr. Bins believed that within a short time directional wireless for flying in fog or at night would be combined in one unit with the new duplex system of radio telephony.

Another prediction of Mr. Bins' was that in the near future it would be possible for anyone desiring to communicate with a passenger in flight to pick up the phone in home or office, call radio central and get in communication with the airplane passenger with so little delay as is required now in securing a long distance connection. During the next two or three years commercial airplanes will be controlled entirely by radio signals as trains are now controlled by block signals. Pointing out that it had taken radio twenty years to reach its present development, Mr. Bins used this fact as a corollary to airplane development. It was only when radio had been perfected technically that the public took it up and its commercial era came with a rush. Similarly greater perfection in the commercial airplane would within a couple of years see a proportionate sudden development in air transport.

R. R. Blythe briefly outlined the purport of a petition addressed to the Contest Committee of the Aero Club of America which had been signed by the leading manufacturers and authorities in the aeronautical industry. The petition requested the Contest Committee to announce an early decision on the protest of J. M. Larsen in connection with the Efficiency Contest held at Omaha last fall. This petition was circulated among those attending the luncheon all of whom signed it.

Fast Flight of Loening Air Yacht

A remarkably fast flight was made on April 17 by the Loening air yacht N-ABCF, pilot Dave McCulloch, when it covered the 1220 miles separating Palm Beach, Fla., from New York City in 9 hr. 56 min. with one stop en route. The average speed for this distance works out as 123 m.p.h.

Pilot McCulloch left Palm Beach at 5:48 a. m., heading up the Atlantic coast. The first part of the journey was accomplished in a cross wind which slowed down progress, and later fog was encountered rolling in from the sea. To escape the fog, the pilot came down close to the sea, flying at times only 20 ft. over the water, and following the coast line. St. Augustine was passed at 7:53 a. m., and Charleston at 9:58 a. m., and at 11:11 a. m. a landing was made at Southport, N. C., where the pilot and Fred Golder, his mechanic, had a hasty lunch, and 90 gal. of fuel were taken on board.

The air yacht took off again at 12:31 p. m. and by then the weather had cleared up sufficiently that the pilot deserted the coast line at Pimlico Sound and Cape Hatteras and flew by compass across that stretch of water. The Virginia coast proved bad, however, for rain was coming down pretty heavily. At 4:23 p. m. Atlantic City was passed and at 5:04 the boat landed at the Columbia Yacht Club anchorage, 82nd St. and Hudson River, New York, where Grover C. Loening, designer of the air yacht, greeted the aerial voyagers.

For this flight the Loening air yacht had been fitted with extra gasoline tanks giving the ship a fuel capacity of 135 gal. in place of three of the five seats.

New 2nd Assistant Postmaster General

Lt. Col. Paul Henderson, of Chicago, whose nomination as 2d Assistant Postmaster General was sent to the Senate by President Harding on April 4, will have charge of the Air, Railway, Foreign, Alaskan, Seaport and Naval Mail Services.

Mr. Henderson, named to succeed G. H. Shaughnessy, who died from injuries received in the Knickerbocker Theater disaster, is a native of Chicago and an engineer by profession, but is considered an expert on transportation. He is the son-in-law of Representative Madden of Illinois, having married Miss Mabel Madden of Chicago.

At present Mr. Henderson is one of the officers of the Drownell Improvement Co., a middlewest stone corporation, and has been connected with the Western Stone Co., of Chicago, for several years. He also served with the Olds Motor Works of Lansing, Mich., where he was associated with Howard Coffin of the Aircraft Production Board and a member of the committee which developed the Liberty Motor during the war. Later on Mr. Henderson became president of the Western Stone Co. and managed all matters connected with the business of the firm.

In 1917 Mr. Henderson resigned from this company to enter the Army, where he was commissioned a Captain in the Ordnance Department on Oct. 1, 1917, and promoted to a Major on Feb. 8, 1918. Part of his service was in France where he was on duty at the port of St. Nazaire. As ordnance officer he was charged with handling a large part of the freight, ammunition, and supplies for the A.E.F. which passed through that port. He was awarded a certificate of merit by his commanding General and in March, 1919, was discharged into the Ordnance Reserve as a Major to rank from April 30, 1919, and appointed a Lieutenant-Colonel on Aug. 8, 1919.

Since leaving the Army Mr. Henderson has been treasurer of the Andrews Engineering Co., of Chicago, engaged in the manufacture of bridge operating machinery.

Mr. Henderson is thirty-seven years of age, and has three children. In Chicago he is a member of the Hamilton Club and is said to be very popular in a wide circle of friends and acquaintances in that city. Although he has never served in the Postal Service in any capacity, nor the Air Service, his wide experience in transportation work, engineering and business in general is believed to have equipped him well for the duties of his new office, which includes the operation of the Air Mail and Radio Service of the Post Office Department.

Surplus Army and Navy Aircraft

Surplus airplanes, engines and flying accessories no longer needed by the Army and Navy are being placed on the market for commercial and private purchase. A recent survey of Naval flying equipment has resulted in offering for sale 159 planes ranging in price from $200 to $1000 each. Some of them are new, while others are used, and a few are without engines, but generally they are being sold at less than 30 per cent of their cost, which in war times was high.

Cost prices are not shown in a new Navy catalog, but last year's catalog showed in some instances that the selling price was one-third of the cost. Last year the Navy disposed of 63 planes, the total receipts for which are not available.

Army planes and engines have been sold by sealed bids as low as ten per cent of their original cost. Last year out of an estimated cost of surplus airplanes, engines and parts, of $61,536,517, $26,981,667 was disposed of with a return of about ten per cent. Over nine million dollars worth of planes and spares was transferred to other government branches, and five million dollars worth was reissued and used in the Air Service.

On April 1, bids were called for on 100 Standard J1 planes located at Houston, Texas, and recently bids were asked for on 100 Curtiss JN4D training planes located at Buffalo. Two hundred Curtiss OX motors at Millington, Tenn. have also been put on the market.

The Army recently sold 1300 Hall-Scott motors and 500 other engines. The Curtiss company has repurchased about 2000 of their training planes for about $2,000,000. for remodelling, it is reported.

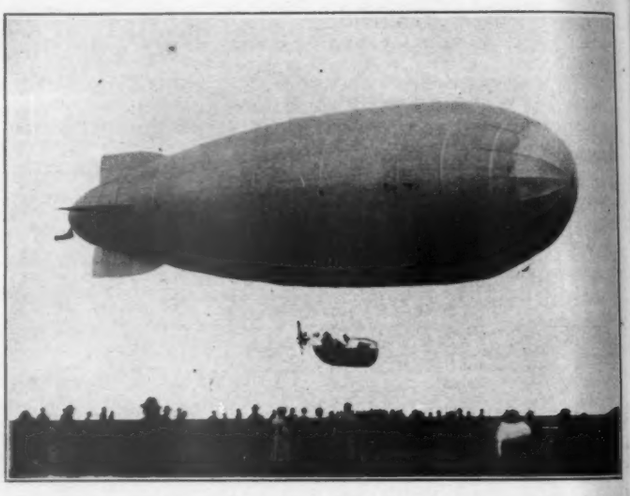
The Italian Type SCA1 Airship

On February 18, last, the smallest semirigid airship of the world was christened in Rome. This ship, called the SCA1, was built by the Stabilimento di Costruzioni Aeronautiche, for the Spanish Army, and another ship of the same type is soon to be completed.

The principal characteristics and dimensions of the SCA1 are the following:

Length over all	129 ft.
Diameter	28 ft.
Height	42 ft. 6 in.
Capacity	53,000 cu. ft.
Power plant	2 40 hp. Anzani
Capacity	53,000 cu. ft.
Fixed weight	2400 lb.
Disposable lift	1250 lb.
Equipment	66 lb.
Crew	304 lb.
Lest	220 lb.
Fuel and oil	660 lb.
	1250 lb.
Consumption per hr. (1 engine)	33 lb.
Maximum speed (two engines)	50 m.p.h.
Cruising speed (one engine)	37 m.p.h.
Range (at maximum speed)	500 m.p.h.
Range (at cruising speed)	800 m.p.h.
Service ceiling	6000 ft.

This ship posseses a very good performance for its small size and horsepower, and its disposable lift is very satisfactory considering the weight of a rigid keel under the envelope. Only a few years ago for the same kind of service it would have been necessary to have about 88,000 cu. ft. with a nonrigid airship, and then the speed would have been much lower. The nacelle accommodates a crew of two and also two or three passengers.



The Italian airship SCA1, built for the Spanish army—the the smallest semirigid in the world

International Aircraft Co.

A new aircraft incorporation known as the International Aircraft Co. of Kansas City, Mo., has just been formed. The company has taken in the plant and facilities of Valentine Gephart, Inc., of 119 Brush Creek Blvd., Kansas City.

The officers of the new company are: R. H. Hawley, president; Valentine Gephart, vice president and general manager; Francis D. Ross, treasurer; Curtis Smith, secretary. In addition to building airplanes, propellers and engines and handling supplies, the company will furnish consulting engineering service.

The Curtiss "Cactus Kitten" racing triplane which Bert Acosta is to fly at National Flying Meet at Curtiss Field, Mineola, L. I., on April 30

National Flying Meet, April 30

More than sixty airplanes have already been entered in the first of the national flying meets sanctioned by the Aero Club of America and the Aeronautical Chamber of Commerce, which will be held at Curtiss Field, Garden City, L. I., N. Y., Sunday, April 30.

The Rotary Club of New York is supporting the event which is designed to show the progress made in the development of American commercial aircraft during the last six months. The Rotarians will have a special section reserved for them and their friends.

Many new types will be flown in the various exhibitions and contests, which include races, speed trials, parachute jumping, efficiency and performance tests and passenger carrying. It is the first of a series of such flying meets to be held throughout the United States this year, to demonstrate to the business and professional public the peculiar qualities of the flying machine in speed and economic operation.

Spokane News

Raymond Small and George Stonebraker of Lewiston, Idaho, are negotiating for an airplane of 150 hp. to open an air route from Lewiston via Grangeville to the Chamberlain basin on the middle fork of Salmon river, for the accommodation of hunters who desire to visit that game region. The distance between Lewiston and the basin is about 100 miles, and under present conditions the trip involves seven days of toil by horseback and pack saddle.

To negotiate the trip planes will require to attain a height of 10,000 ft. on leaving Grangeville, for in case of trouble the plane must return to Grangeville or glide into the basin.

By a contract signed up with the Curtiss Aeroplane & Motor Corp. the United States Aircraft Co. of Spokane is authorized agent of the Curtiss firm, and entitled to sell ships throughout the Northwest, according to announcement made by C. H. Messer, head of the local concern.

"We will immediately put in a complete stock of parts for Curtiss ships and motors, as well as carrying the stock of Standard ship parts as we do at present," Mr. Messer said, "This will give us the agency for ships and parts for the entire northwest. We will carry complete parts for every ship now flying in the district. We will specialize in giving quick service on airplane parts and supplies, as well as in carrying on our general flying business."

Western Airway Service

California started the first regularly scheduled commercial flying service in the country on Sunday, March 26, when six airplanes of the air fleet of the Western Airway Co. took off from the Marina Flying field in San Francisco. The service is now being maintained between San Francisco and Los Angeles on the schedule of two regular trips a day, with a $50 one-way fare.

Flying time between the two terminals, at both of which fields have been established, is approximately 5 hr., with stops at Salinas and Santa Maria for rest and lunch. Eight airplanes will maintain the service, carrying either two or four passengers in addition to the pilot, and leaving the Marina, San Francisco, at 8:30 and 10:30 o'clock in the morning. In this number are included two Aeromarine HS flying boats.

The first flight, on March 26, was more in the nature of a demonstration with several notables of the state and newspaper reporters.

The Western Airway Co., which is offering this service to the public, is the outgrowth of the Thompson Aircraft Co., which recently closed its third year of operation. During this time the company has established a record of no accidents during the entire three years. The pilots of the fleet are all men of long flying experience, each with over a thousand flying hours on his records.

Commercial operation of the company is in the hands of men well known in California travel circles. Foster Curry, until recently manager of Camp Curry, in the Yosemite National Park, is actively connected with the direction, and his associate, Wallace B. Curtiss, will be resident manager in Los Angeles. J. E. Thompson is business manager, and his brother, R. S. Thompson, a flier of long experience and for two years a United States Army flying instructor, will have charge of pilots, ships and equipment.

Grover C. Loening Operated On

Grover C. Loening, president of the Loening Aeronautical Engineering Corp., was recently operated on for appendicitis at the Kniekerbocker Hospital by Doctor D. W. Martin, Chief Surgeon of St. Luke's Hospital.

The attack was very sudden, but the operation was entirely successful. Mr. Loening has now left the hospital and is expected to be back at his work in a week or ten days.

ARMY AND NAVY AIR NEWS

Air Service

Army Orders—First. Lieut. Oliver A. Gottschalk, A. S., now at Walter Reed General Hospital, Takoma Park, D. C., will report to Brigadier Gen. Walter D. McCaw, Medical Department, president of an Army retiring board at Washington, D. C., for examination by the board.

First Lieut. Russell L. Williamson, A. S., now on temporary duty at Carlstrom Field, Arcadia, Fla., is relieved from duty at March Field, Riverside, Calif., and will proceed to Post Field, Fort Sill, Okla., and report on or about June 15, 1922.

First Lieut. Frank T. Honsinger, A. S., is relieved from duty at Carlstrom Field, Arcadia, Fla., and will proceed to Post Field, Fort Sill, Okla., and report on or about June 15, 1922, to the commandant for duty and advanced observation training.

First Lieut. Auby C. Strickland, A. S., is relieved from duty at Carlstrom Field, Arcadia, Fla., and will proceed to Ellington Field, Houston, Tex., and report to the commanding officer on or about April 15, 1922, for duty and advanced pursuit training.

First Lieut. John E. Upston, A. S., now on duty at the Montgomery Air Intermediate Depot, Montgomery, Ala., will report to the commanding officer, 22nd Squadron, Observation, for duty.

Capt. Arthur E. Simonin, A. S., is relieved from further duty at Mitchel Field, L. I., N. Y., will proceed to Langin Field, Moundsville, W. Va., take station, assume command, and report by letter to the Chief of Air Service and to the commanding general Fifth Corps Area, Fort Benjamin Harrison, Ind.

First Lieuts. James B. Dickson, David W. Goodrich, Paul H. Kemmer and Paul G. Wehle, A. S., are relieved from duty at Carlstrom Field, Arcadia, Fla., and will proceed to Post Field, Fort Sill, Okla., and report on or about June 15, 1922, to the assistant commandant for duty and advanced observation training.

First Lieuts. Alfred Clement, jr., Ray H. Clark, Clayton Shangraw and Lyman P. Whitten, A. S., are relieved from duty at Carlstrom Field, Arcadia, Fla., and will proceed to Kelly Field, San Antonio, Tex., and report to the commanding officer, Kelly Field, for duty and bombardment training.

Capt. Joshua D. Powers, Inf., is detailed in the Air Service, effective June 25, 1922. He will proceed at the proper time to Carlstrom Field, Arcadia, Fla., and report in person to the commandant Air Service Pilot School for duty and pilot training for the course beginning on or about July 1, 1922.

* * *

Kelly Field—During the week ending March 18, the 13th Squadron at Kelly Field made seven cross country trips (thirteen flights) using five XBIA's and two DH's. These mark the first cross country trips ever attempted with the XB's, the ban on cross country on this type of ship, being only recently lifted. One plane was forced down, due to a broken oil lead, but same was repaired and the planes returned to Kelly Field without further mishap. The 13th Squadron pronounces them an ideal type of ship for cross country flying, if the vibration of the motor can be overcome. The gas consumption is very low.

* * *

Mather Field—The advanced training of flying cadets at Mather Field is going along with particular success in smooth formation flying. Flights of eleven and twenty-three ships each have been practiced for the past ten days, with an officer as flight commander, the cadets piloting the other ships. These formations were part of the attraction at the Aerial Circus held at Mather Field on March 19 for the benefit of the Army Relief Society and the improvement of that field.

Luke Field, Hawaii—The 4th Squadron (Observation) Capt. H. H. Young, commanding, which has been stationed at Luke Field since Jan. 24, 1920, has been relieved from duty with the 5th Group and ordered to proceed to Schofield Barracks to become the nucleus of the Hawaiian Divisional Air Service. Henceforth the function of the squadron will be solely observation in conjunction with problems affecting the Hawaiian Division. Accompanying the 4th Squadron to duty with the Hawaiian Division are the 11th Photo Section and Branch Intelligence Office No. 11.

Maj. George E. Stratemeyer, Air Service, has been assigned as Divisional Officer, Hawaiian Division. The flying field selected has been used as a cavalry drill ground, is well located near the railroad and road, has sufficient space for the erection of buildings, hangars, etc., and is large enough for any type of airplane. Canvas hangars are being erected, and the field is being cleared of weeds and underbrush, which has grown up in spots. The enlisted personnel are being quartered in the 35th Infantry Barracks, and the officers are assigned quarters in the 21st, 27th and 35th Infantry areas. A study of the field is being made, and estimates of funds for necessary construction work are being prepared.

* * *

326th Observation Squadron (Reserve)—Excellent progress has been made in the organization of the 326th Observation Squadron, of the 101st Division, which is now 75 per cent complete in its organization. The headquarters of the squadron is at Durand, Wis.; the headquarters of the 1st Flight Section is at Madison and the headquarters of the 2nd Flight Section at Milwaukee. The Squadron Commander, Capt. Horace P. Orlady, will soon have completed his permanent assignment of personnel, and hope is entertained that there will be some training this year for such officers as are available.

Naval Aviation

Hampton Roads Naval Air Station—The Langley detachment at Hampton Roads naval air station made 288 precision landings during the week ending March 25. Two tests on the dummy landing and flight deck were also made.

The A5751 Parnall Panther's engine backfired upon starting recently, setting the plane on fire, which required the attention of the whole crew before it was extinguished. No serious damage was reported, however.

The experimental squadron at Hampton Roads made nineteen flights during the past week, totaling 17½ hr in the air.

A thorough inspection of the cars of the C7 and C9 was made with the result that the C9 car required some replacement and repairs. The installation of the new hydrogen plant was completed and 12,525 cu. ft. of gas was made.

* * *

Balboa Naval Air Station—Reports from the Naval Air Station at Balboa, C. Z., state that the climatic conditions there, alternating wet and dry seasons, are responsible for the rapid deterioration of aircraft material in storage. The average relative humidity even in the dry season, is said to be 80 per cent.

An inspection of three F5L's assembled but held in reserve, showed that their gas tanks had become badly corroded, though placed in reserve after not more than 25 hr. flying apiece. Although the tanks were drained, thoroughly dried and sealed before storing, some were completely eaten through in the bottoms, "giving some idea of the deterioration" in the Canal Zone, the Commandant reported. Nine planes of this type stored in the station at present will be practically worthless after another year's storage, it is believed. Aircraft in reserve require nearly as much attention as those used daily, and with limited personnel the problem of upkeep is difficult.

(c) International Films

Front view of the Parnall "Puffin" shipplane with wings folded for stowing

With two HS2L's and one Model 40 Aeromarine in the operating quota, the commandant says it is very hard to carry on weekly routine of operations due to the upkeep involved, especially with hulls. Flying during the past month was carried out in winds averaging 30 m.p.h. in considerable rough water, which conditions obtain until the last of June or the end of the dry season. Even the bombs are deteriorating and have to be red-leaded.

Surveyors of the Canal laid off a new flying field for the station recently, prior to its draining. Enlisted personnel are working on the field clearing it of large pieces of coral and leveling it off, temporarily as an emergency landing field.

Miss Ethelda Bleibtrey, a swimmer of national note took part in a swimming meet held by the Air and Submarine stations. An uninhabited barracks has been turned into a recreation hall.

* * *

Fate of Naval Reserve Fliers—Charges that naval reserve flying officers were "thrown out like so much junk" by heads of the naval air service when the officers sought transfer into the regular service were made by Senator Walsh, Massachusetts, before the Senate naval committee, at an investigation of his allegations of unfairness by the navy in the examination given the reserve fliers. His resolution, adopted in December, asserted that the examinations for transfer were unfair and unreasonable and held that the individual ability of the officer was not given consideration.

Detailing his charges before the committee, the Massachusetts senator said that about 200 officers, mostly volunteers during the war, were about to be forced out of the navy because they had failed in examinations for which they had no opportunity to prepare and which included subjects wholly unrelated to aviation.

* * *

Navy Orders—Lt. Comdr. Horace T. Dyer, to duty Bu. Aeronautics, Navy Dept., Washington, D. C.

Lieut. George F. Chapline, det. Naval Air Station Pensacola, Fla.; to post-graduate course in Aeronautical Engineering Naval Academy, Annapolis, Md.

Lieut. Harold Dodd, det. Naval Air Station Pensacola, Fla.; to post-graduate course in Radio Engineering Naval Academy, Annapolis, Md.

Lieut. Calvin T. Durgin, det. U. S. S. Aroostook; to post-graduate course in Aeronautical Engineering Nav. Academy, Annapolis, Md.

Lieut. Donald R. Evans, det. U. S. S. Wright; to post-graduate course in Electrical Engineering Naval Academy Annapolis, Md.

Lieut. John S. Farnsworth, det. Naval Air Station Pensacola, Fla.; to post-graduate course Aeronautical Engineering Naval Academy, Annapolis, Md.

Lt. (jg) George H. Hines, RF, det. Naval Air Station, Coco Solo, C. Z.; to home wait orders.

Lieut. Jesse H. Smith, det. Naval Air Station Pensacola, Fla.; to Officer in Charge Navy Recruiting Sta. Birmingham, Ala.

Lieut. James H. Strong, det. Naval Inspector of Aircraft, Gallaudet Aircraft Corp, East Greenwich, R. I.; to Inspector of Naval Aircraft, Glenn L. Martin Co., Cleveland, Ohio.

Bosn. Farrell N. C. Overall, det. Inspector of Naval Aircraft Material, Stout Engineering Laboratories, Inc., Detroit, Mich.; to duty Glenn L. Martin Co., Cleveland, Ohio.

Corp. Milton De Milt, det. Inspector of Aircraft Material Stout Engineering Laboratories, Inc., Detroit, Mich.; to duty under instruction Curtiss Aeroplane & Motor Co., Garden City, L. I., N. Y.

Marine Corps Aviation

Eagle vs. Airplane—A mortal combat in the air between an eagle and a Marine Corps airplane in which the King of the Air found himself dethroned, took place near Quantico, Va., recently according to *The Leatherneck*, a Marine Corps publication.

Lieut. R. O. Sanderson was flying over the Potomac near the flying field when he saw a flock of birds some distance away and gave chase. An eagle which had been hovering high over the flock wheeled on his approach and at top speed flew directly toward him. Fortunately for the aviator the bird did not reach him but struck head-on one of the wire braces of the plane with such force as to break both the brace and the eagle's neck. Caught between two guys on the wing of the plane the bird was carried along with it and Lieut. Sanderson made a landing with his catch which measured seven feet from tip to tip of its wings.

* * *

Flight "L", Sumay, Guam, M. I.—An altitude flight of 8600 ft. was made in F5L 3591 by 2nd Lieut. D. E. Keyhoe, Feb. 4. F5L's 3591 and 3661 were tested on Feb. 4 after overhaul.

Coming Aeronautical Events

AMERICAN

Apr. 24 — Fourth Aviators' Ball, Hotel Astor, New York. Tickets: 80 W. 40th St.

Apr. 30 — Spring Show and Opening Meet, Curtiss Field, Mineola, L. I.

May 30 — Fourth Annual Aircraft Exhibition, Logan Field, Baltimore, Md.

May 31 — National Balloon Race, Milwaukee.

June 15-17 — Flying Meet, Monmouth, Ill.

Sept. 4 (about) — Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)

Sept. 15 (about) — Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)

Sept. 30 — First Annual Interservice Championship Meet. (In preparation.)

FOREIGN

August — Coupe Jacques Schneider. (Seaplane speed race.) Naples, Italy.

Aug. 6 — Gordon Bennett Balloon Race, Geneva, Switzerland.

Aug. 9-24 — Soaring and Gliding Competition, Gersfeld, Germany.

Sept. 22 — Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.

American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

Foreign News

Argentina—Consul General W. Henry Robertson, Buenos Aires, states that the new flying ground and school acquired by the Argentine Aerial Club at San Isidro, alongside the grounds of the River Plate Aviation Co., have been opened for use, more than twenty machines taking part in the ceremony.

* * *

Belgium—The Aero Club of Belgium has organized an international competition for touring airplanes to be held at Brussels on June 23-25, 1922. The competition is open to touring machines, single-seaters or multi-seaters, whose engine capacity does not exceed 7 liters. The awards will be made for a total of 100 points, allotted as follows: 30 points for minimum space occupied in hangar; 30 points for general economy of the engine; 25 points for slow landing; and 15 points for quick get-off.

The prizes are as follows: The King of Belgium's Challenge Cup, to be retained by the winner for one year; and the following cash prizes: 1st prize, 15,000 francs; 2nd prize, 7,000 francs; and third prize, 3,000 francs.

* * *

Colombia—According to Edmund B. Montgomery, American Vice Consul at Barranquilla, Colombia offers an opportunity for the establishment of an air transport service.

As the river steamship transportation is uncertain in the dry season, which is now coming on, an air service with machines carrying ten to fourteen passengers would undoubtedly get all the passengers and freight that could be carried, although one drawback to large air boats on the river is the danger from contact with driftwood in starting and landing. The ratification of the American-Colombian treaty should be a help in any negotiations which may have for an end the establishment of such seaplane service on the Magdalena River by American interests in cooperation with Colombians.

* * *

France—It is reported that the prize of one million francs offered for the best aero engine will probably be augmented by another million, offered by the French Air Minister, for engines of 350 to 450 hp., and weighing not more than 2 lb./hp. It is understood that competing engines will have to pass a reliability run of 240 hr., in stretches of 8 hr. each, and that the total time taken in completing the 240 hr. must not exceed 100 days. The competiton will start on March 1, 1924, and entries must be received before Dec. 1, 1923.

Announcement has been made that the Aviation Committee of the Colonial Exchequer have definitely decided to organize a contest for seaplanes from April 17 to 19, under three classes: under 150 hp.; 150 to 400 hp.; and over 400 hp. Eliminatory trials are to take place on April 17, when entered aircraft must ascend to 1000 m. and have on board, in addition to the normal useful load, sufficient fuel for 1½ hr. flight. The course, Marseille-Monaco, is 413 kilomters. Prizes to the extent of over 40,000 francs are offered.

* * *

Italy—To establish more rapid communications between Italy and Tripolitania, the Secretary of the Colonies, Hon. Girardini, is endeavoring to organize an aerial mail service from Rome to Tripoli that may eventually be used also for the transportation of passengers. For this purpose the Superior Command of Aeronautics has granted the use of the airship Esperia (ex-Bodensee) to make its first flight, which will take place in the coming Spring. In the meantime, while they are completing certain works in order to prepare the airplane for her flight, her commandant, Major Valle, will go to Tripoli personally to make sure of a safe landing.

* * *

Palestine—The Palestine General Post Office has just announced the inauguration of a fortnightly mail service by airplane from Palestine to Mesopotamia, according to a report received by the Department of Commerce from Consul Southard at Jerusalem. There has been a military service over this route for some time, from Cairo via Palestine and Transjordania. This announcement merely opens the service to the public.

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